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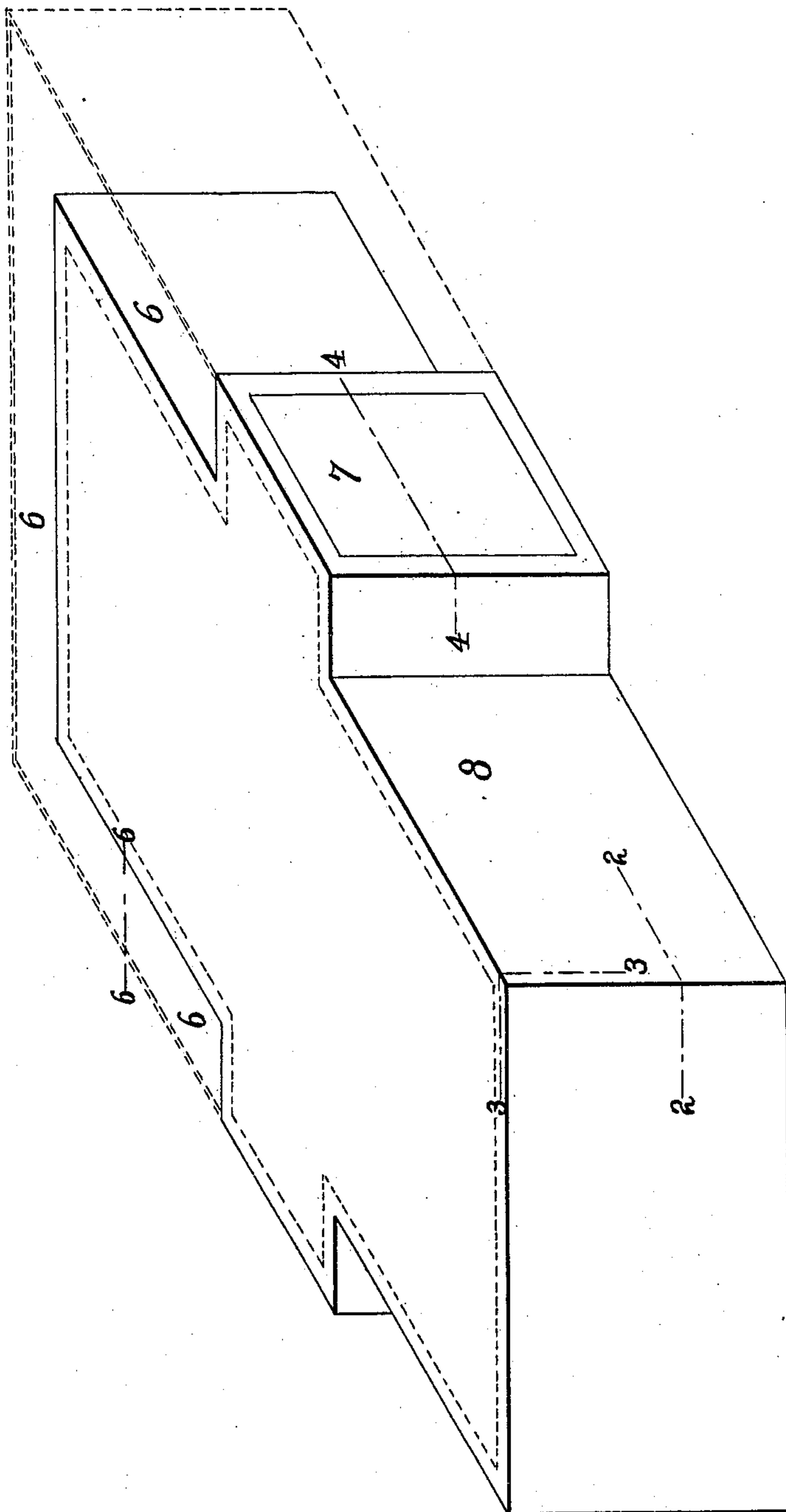
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E. C. SHANKLAND.
SAFETY DEPOSIT VAULT.

No. 597,694.

Patented Jan. 18, 1898.

Fig. 1.



Witnesses:
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John Carrol

Inventor:
Edward C. Shankland
By Paul Symmetreolt Atty.

(No Model.)

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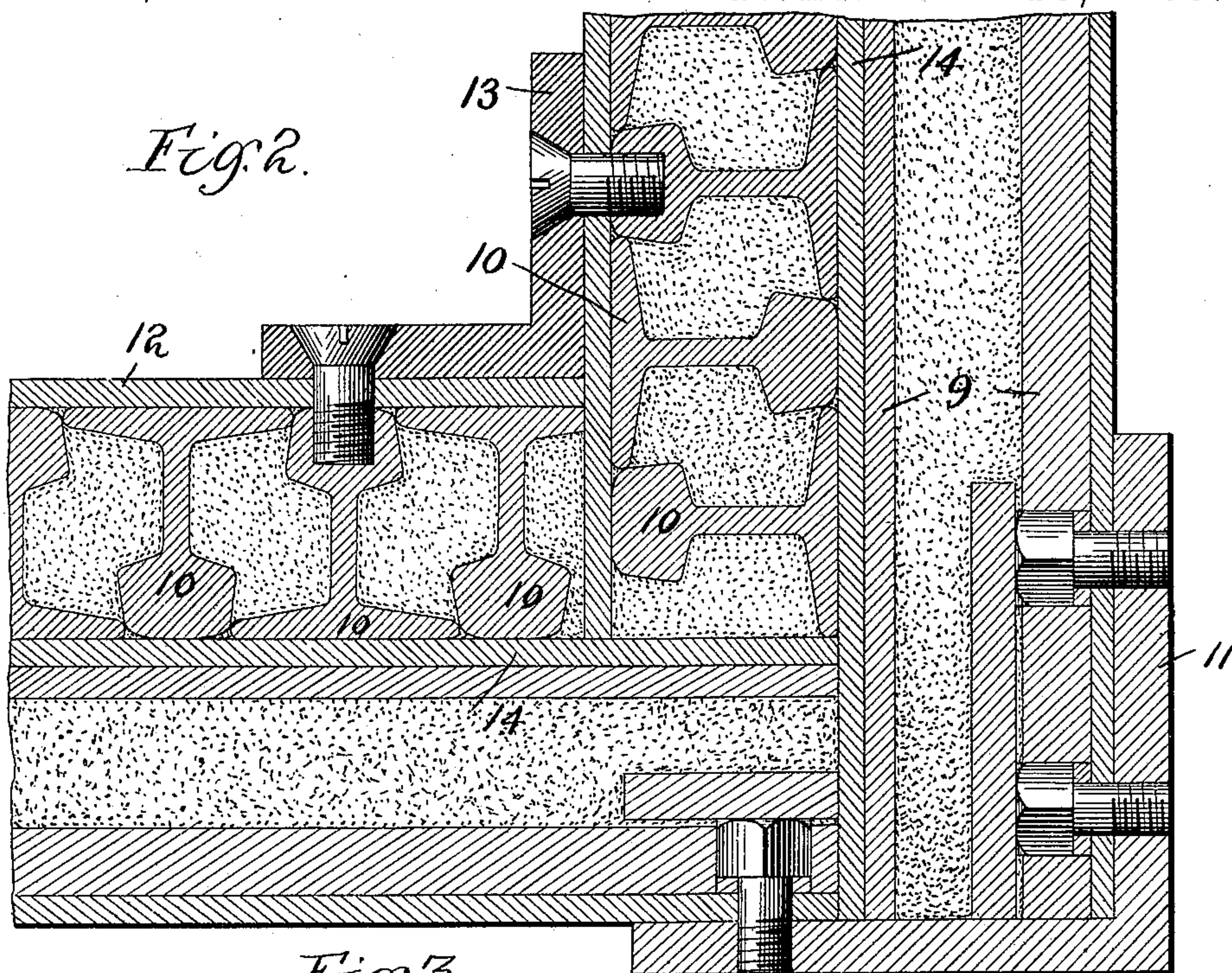
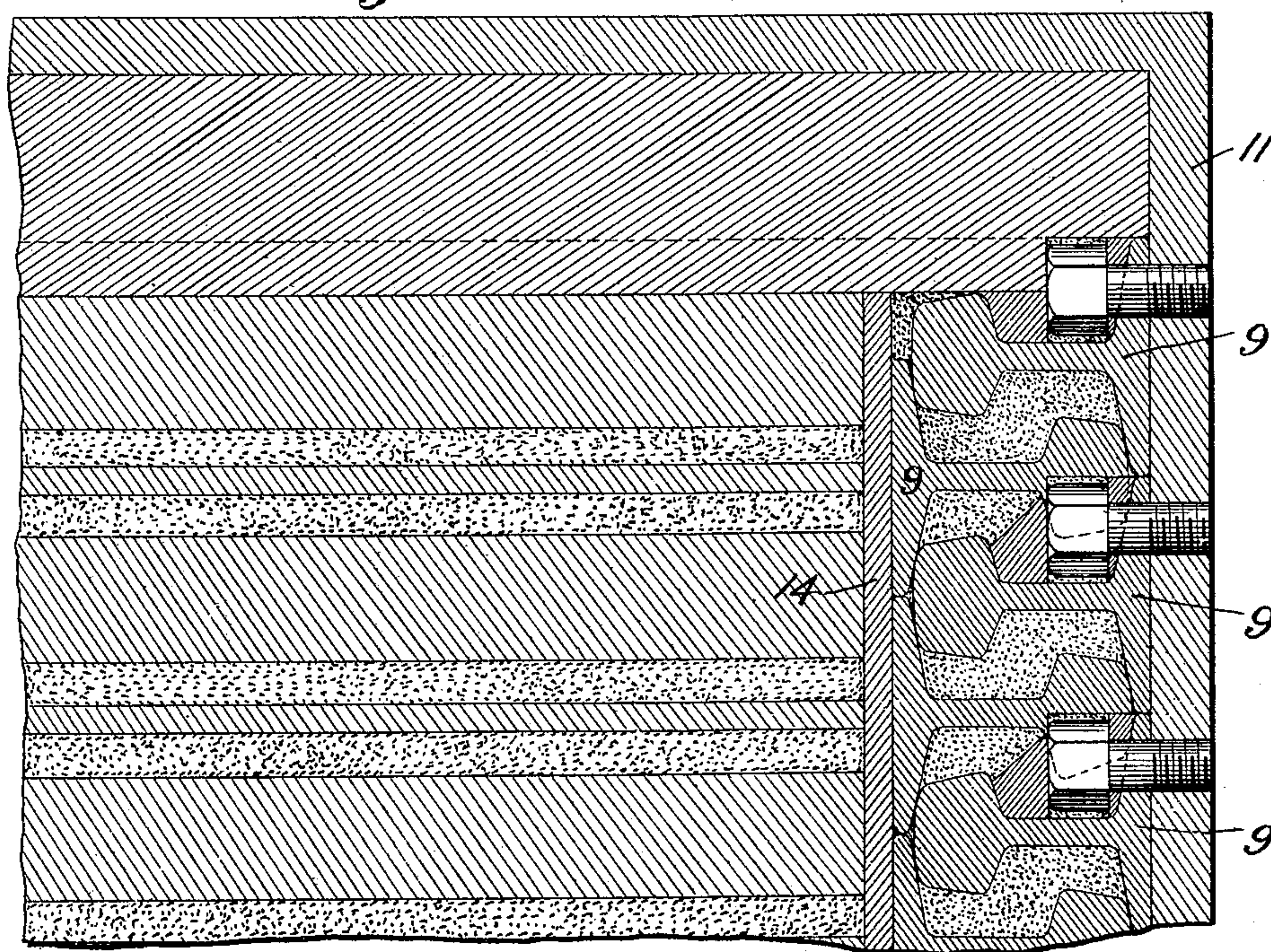


Fig. 3.



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John Carrol

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(No Model.)

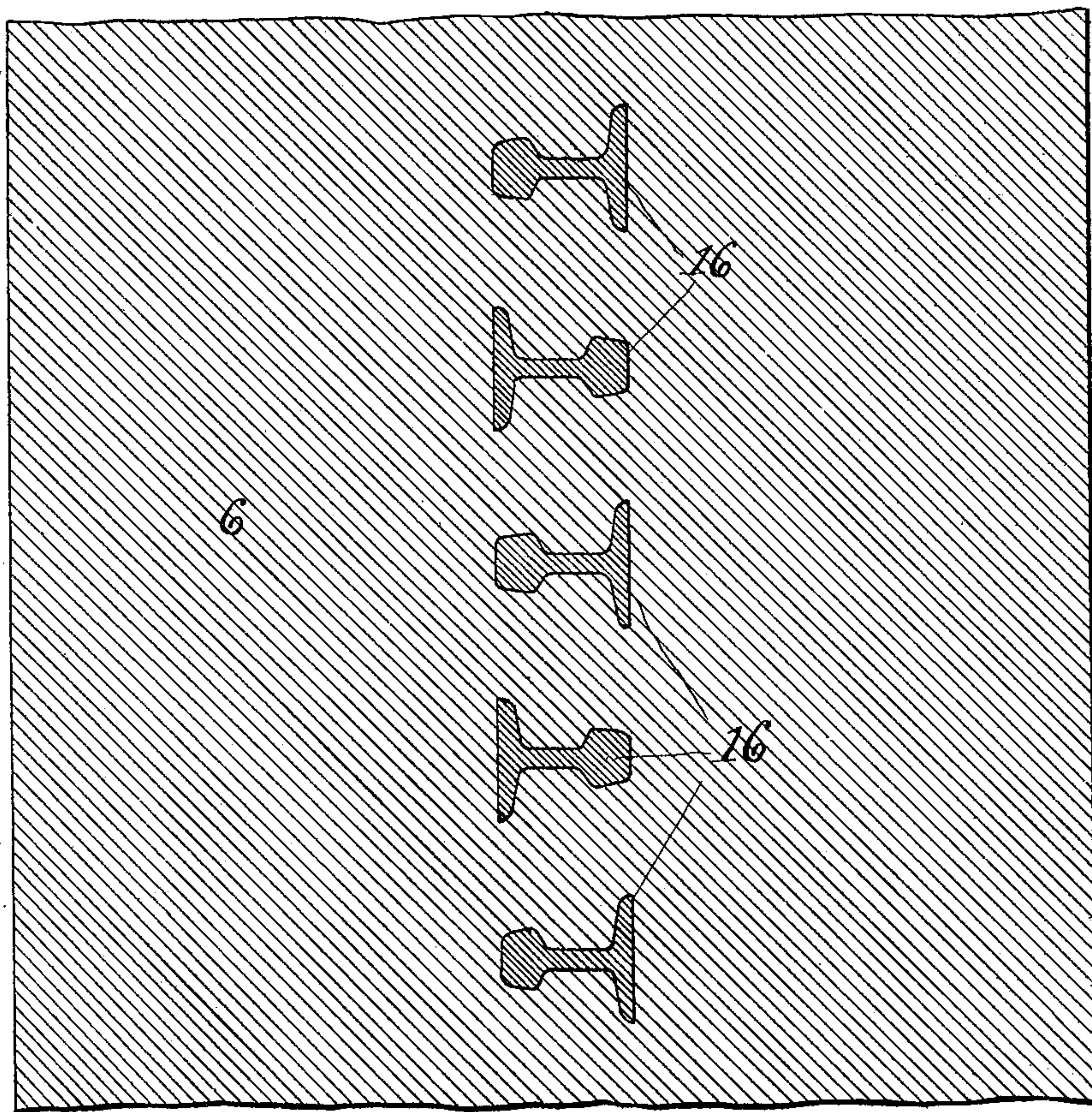
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Fig. 4.



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Inventor
Edward C. Shankland
by *Paul Symonstedt*
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UNITED STATES PATENT OFFICE.

EDWARD C. SHANKLAND, OF CHICAGO, ILLINOIS, ASSIGNOR TO D. H. BURNHAM & CO., OF SAME PLACE.

SAFETY-DEPOSIT VAULT.

SPECIFICATION forming part of Letters Patent No. 597,694, dated January 18, 1898.

Application filed July 16, 1897. Serial No. 644,852. (No model.)

To all whom it may concern:

Be it known that I, EDWARD C. SHANKLAND, a citizen of the United States, residing in Chicago, Cook county, Illinois, have invented certain new and useful Improvements in Safety-Deposit Vaults, of which the following is a specification.

Heretofore the two means generally employed by criminals to effect entrance to safety-deposit vaults have been drills or other like tools and explosives. To resist penetration by these means, various constructions have been proposed, among which may be mentioned the use of metal, generally steel, of extreme hardness and great thickness or of metal combined with cement or other hard substances variously arranged. These constructions have, to a considerable extent, at least, been successful in resisting attack by the means mentioned; but the progress of modern science has lately developed a new destructive agent, against the action of which such prior constructions are of but little avail. Experiment has shown that with the electrical connections which are to be found conveniently at hand in nearly every modern building a criminal has but to attach some form of contact connection to any live wire within reach to enable him to burn, or, more properly speaking, melt or fuse a large hole through many inches of metal within a comparatively few minutes, and the hardness of the metal is of course no hindrance to such an attack. So far as I am aware no specific attempt has been heretofore made to overcome the new difficulty mentioned, and yet the extreme rapidity and ease with which large openings can be made in vault-walls as heretofore built by the employment of an electric current brings a problem before the manufacturers of safety-deposit vaults in the solution of which any suggested means which will retard the operations of the criminal for any appreciable length of time, even though it be but a few minutes, becomes worthy of serious consideration. Metal can be used to afford strength and resist the action of tools, or masonry can be employed to resist the action of the electric arc, or both could be employed together; but to get the best results possible something further is required. By

my invention I am enabled to make the penetration of the vault by any of the agencies above referred to, taken singly, a task of extreme difficulty and to retard the operations of the criminal by two or more of the means combined for a longer time than they would be retarded in attempting to effect entrance through such prior constructions. In other words, what I aim to secure is such a disposition of the metal and concrete that the maximum resistance will be offered to any attempt at penetration by means of either tools, explosives, or the electric arc or the arc combined with any of the other devices employed by criminals for such purpose.

The above and such other objects as may hereinafter appear I attain by the construction illustrated in the accompanying drawings.

Briefly stated, the primary objects of my invention are to overcome the above-mentioned objections, and this I aim to accomplish by the construction which I have specifically pointed out in the appended claims and which I shall now proceed to describe in detail, reference being had to the accompanying drawings, in which—

Figure 1 is an isometric diagrammatic view of a vault constructed in accordance with my invention. Fig. 2 is a section on the line 2 2 of Fig. 1. Fig. 3 is a section on the line 3 3 of Fig. 1. Fig. 4 is a partial section on the line 6 6 of Fig. 1.

The outline shown in Fig. 1 is taken from a vault now in process of construction by me, but might, of course, be departed from at will without departing from the spirit of my invention.

As indicated by dotted lines at 6, Fig. 1, I inclose the entire inside casing of the vault, except the doors 7, with a very thick wall, which I prefer to make of vitrified paving-brick set in Portland cement, and at or near the center of this wall (see Fig. 4) I arrange a number of rails 16, spaced sufficiently close together to necessitate cutting them in two places to force an entrance, and yet not so close but that there is plenty of room between them to hold enough brick and cement to bind the parts of the wall firmly together into a homogeneous mass. The wall of the inside

casing 8 I make of two layers of rails, the interstices between the same being filled with cement or other material of low conductivity. The rails 9, comprising the outer layer, I arrange, preferably as shown in Fig. 3, lying horizontally, the heads pointing alternately toward each other and the flanges and heads somewhat overlapping. The rails 10, which comprise the inner layer, I arrange in position to cross the outer layer preferably at right angles, but these rails, while having their heads pointing alternately toward each other, are spaced farther apart, the flanges not overlapping, there being thus provided more room for concrete between them. The outer layer is secured in position by means of suitable steel framing, including the corner-pieces 11, and the inner layer by lining-plates 12 and the inner corner-pieces 13, and between the inner and outer layers I provide a separating-plate 14, arranged as shown.

Considering now the advantages of the above-described construction it will be seen that if, supposing the inclosing wall to have been penetrated, an attempt be made to burn a hole through the inner casing and the carbon happens to follow directly along the center line of the web of one of the outer layers of rails 9 (a little more destructive action of the electric current being thereby made possible) it is extremely improbable that the carbon will also strike the web of one of the inner layers, but at some point in the wall short of complete penetration will encounter a heavy mass of concrete embedded in the interstices between the steel, and the concrete not being readily acted upon by the electric current will materially retard further operations. The object of spacing the inner rails farther apart than the outer ones and arranging the two layers to cross each other can now be clearly seen. By this means a greater proportional amount of concrete resistance is provided, less steel is needed, and at but comparatively few points in the entire wall-surface of the inner casing will there be metal clear through in a straight line. By my improved construction I secure, further, great additional strength whereby to resist mob violence, for if the inclosing wall had no rails embedded in it, or if but a single layer of rails were used for the inner casing, or if two layers were used running in the same direction, it would obviously not insure the stiffness that I secure by my invention.

I am aware that it has been heretofore proposed to use walls which instead of being made entirely of metal are constructed of a layer of rails embedded in concrete, and these would afford better resistance to the electric arc than a wall composed entirely of metal. Still other constructions have been proposed in which in order to secure great strength the floor of the vault has been made of rails embedded in concrete, an under layer of closely-laid rails being first made and then an occasional cross-rail placed upon the under layer,

the whole being infilled and inclosed in concrete, and the cross-rail in the concrete layer serving as a support for the floor-plate; but as far as I am aware there is nothing in the prior art which contains any disclosure or even any suggestion of the destructive action of the electric arc above referred to or the use or adaptability of any construction heretofore shown to resist such action.

It will be readily seen that in a wall constructed of a single layer of rails having the spaces therebetween filled with concrete or other material of low conductivity the various criminal devices described may still be used with considerable effect by burning out a portion of the web of one of the rails and when this is accomplished employing a chisel or similar tool to break out and remove the adjoining concrete. Supposing an attempt be made to enter a vault built in accordance with my invention, it can readily be seen on a moment's thought how I secure a greater amount of resistance than can be obtained by any of the above-mentioned prior constructions. The electric contacts being properly arranged, an arc may be formed between the carbon which forms one of the terminals and the terminal formed by one of the rails of the outer layer. By this means the web of such rail may be melted away for a considerable distance along its length and the concrete adjacent thereto chipped out by means of a chisel until the abutting rails on either side are encountered. Now comes the difficulty of progressing farther. The rails of the inner layer cross the rails of the outer layer at an angle, making comparatively few points upon the surface of the wall where there is metal clear through in a straight line. To melt out the web of one of the inner layers of rails, the carbon must be moved in a direction at an angle with the movement employed in melting the web of the outer rail, and in attempting this movement the next adjoining rails of the outer layer seriously interfere, as they are arranged or interlocked closely together, and the opening formed in the outer layer, which would naturally be oblong in shape, has its major axis running in a direction at an angle to the direction in which the major axis of the hole in the inner wall must be extended. The same difficulty is encountered as soon as any attempt is made to chip out the concrete which is filled in the spaces between the rails of the inner layer, for the chisel or tool cannot be operated to advantage on account of the interference of the closely interlocked and crossed rails of the outer layer adjacent to the rail which has its web destroyed. Thus in order to work readily upon the material of the inner layer of rails either with the carbon or with the chipping-tools an opening of large diameter in both directions must be made in the outer layer in order to make the inner layer accessible. Supposing on the other hand that a construction of side wall were used similar

to the floor construction before alluded to—
i. e., one having a single layer of rails within
which is a layer of concrete having an occa-
sional rail embedded therein—the results ob-
tained in the practice of my invention could
not be secured, because after penetration of
the outer layer by means of the electric arc
and the chisel it would be comparatively an
easy matter to dislodge a large piece of the
inner layer of concrete either by a tool or
the use of explosives, making a large hole
therein, for an occasional rail arranged as de-
scribed would not make an efficient support
for the non-conducting material.

Having thus described my invention, what
I claim as new, and desire to secure by Letters
Patent, is—

1. In a safety-deposit vault the combina-
tion of a plurality of wall-layers each com-
posed of parallel rails interlocked substan-
tially as shown, and an interfilling of concrete
or other material of low conductivity, the
rails of adjacent layers crossing each other,
substantially as described.

2. In a safety-deposit vault the combina-
tion of a plurality of wall-layers each com-
posed of parallel rails, and an interfilling ma-
terial of low conductivity in the spaces be-
tween adjacent rails; the rails of adjacent
layers crossing each other, and adjacent rails
of the same layer being placed in contact,
whereby to afford an efficient support for
the interfilling material, substantially as de-
scribed.

3. In a safety-deposit vault the combina-
tion of two wall-layers each composed of par-
allel rails, and an interfilling material of low
conductivity in the spaces between said rails;
the rails of the outer layer being arranged

with their heads pointing alternately toward
each other and the flanges and heads over-
lapping, and the rails of the inner layer being
arranged to cross the rails of the outer layer
and with their heads pointing alternately to-
ward each other and the extremities of the
flanges in contact but not overlapping, sub-
stantially as described.

4. In a safety-deposit vault the combina-
tion of a plurality of wall-layers each com-
posed of parallel rails interlocked substan-
tially as shown, and an interfilling of concrete
or other material of low conductivity; the
rails of adjacent layers crossing each other,
and a partition-plate between adjacent layers,
substantially as described.

5. In a safety-deposit vault the combina-
tion of a plurality of wall-layers each com-
posed of parallel rails, and an interfilling ma-
terial of low conductivity in the spaces be-
tween adjacent rails; the rails of adjacent
layers crossing each other, the adjacent rails
of the same layer being placed in contact,
whereby to afford an efficient support for the
interfilling material, and a partition-plate
between said layers, substantially as de-
scribed.

6. In a safety-deposit vault, the combina-
tion with an inclosing wall, of a plurality of
wall-layers each layer composed of parallel
rails interlocked, and an interfilling of con-
crete or other material of low conductivity,
the rails of adjacent layers crossing each
other.

EDWARD C. SHANKLAND.

Witnesses:

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C. M. WILKES.